Revision 0.0

Model : AS2010B 6C_30A(black)

Test Report of IATA/UN Transportation

revised by the Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria

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Product Specification

Model Name : AS2010B 6C_30A(black))

Nominal voltage : 11.1 V

Rated capacity : 6000 mAh

Lithium equivalent content : 5.31 g

Date of issue : 2009.12.30

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Pack Test Program

Test Item	Test Method	Criteria	Fresh			50 cycled	
			100 %	50 %	0%	100 %	0%
T-1 Altitude Simulation	11.6 kPa for 6Hr at 20±5℃	No mass loss (not exceed 0.1%) No leakage, No venting No disassembly No rupture, No fire OCV > 90% of the initial voltage	4	-	4	4	4
T-2 Thermal Test	75±2℃ for 6Hr ↔ -40±2℃ for 6Hrs (Transfer time : 30min), 10cycle						
T-3 Vibration	7Hz → 200Hz →7Hz in15min, 12cycle for 3Hr, 3 direction						
T-4 Shock	Half-sine shock of peak acceleration 150g, duration 6ms 3(pos.)shocks →3(neg.)shocks, 3direction, Total 18shocks						
T-5 External short circuit	Wire: Less 0.1ohm,Case temp. : 55±2℃ for 1Hr or temp. return	Not exceed 170℃, No disassembly No rupture, No fire within 6Hrs					
T-6 Impact	Flat surface, 15.8mm bar, weight:9.1Kg, Height : 61±2.5cm	Not exceed 170℃, No disassembly No rupture, No fire within 6Hrs	-	5	-	-	5
T-7 Overcharge	Current: 2xRapid charge current Charge Voltage 18V Under : 2 x V (Max Voltage) or 22V Charge Voltage 18V Over :1.2 x V (Max Voltage) , Time 24hrs	No disassembly No fire within 7days	4	-	-	4	-

■ Tests T-1 through T-5 shall be conducted in sequence with the same call

■ For test 6, test should be conducted for cells in a pack

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T-1~T-5) Transportation Test (Fresh Pack)

Fresh Pack (100% SOC)			After T-1				After T-2				After T-3				After T-4				After T-5	Result
No	Weight (g)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Max Temp (℃)	
1	344.450	12.837	344.43	0.020	0.006	12.883	344.41	0.020	0.006	12.242	344.40	0.010	0.003	12.176	344.33	0.070	0.020	12.087	55.1	OK
2	344.520	12.841	344.54	-0.020	-0.006	12.881	344.51	0.030	0.009	12.235	344.50	0.010	0.003	12.194	344.42	0.080	0.023	12.096	55.0	OK
3	344.460	12.839	344.43	0.030	0.009	12.894	344.41	0.020	0.006	12.247	344.38	0.030	0.009	12.103	344.31	0.070	0.020	12.091	55.6	OK
4	344.490	12.833	344.51	-0.020	-0.006	12.874	344.46	0.050	0.015	12.225	344.46	0.000	0.000	12.157	344.38	0.080	0.023	12.085	55.5	OK
AVG	344.480	12.838	344.48	0.002	0.001	12.883	344.45	0.030	0.009	12.237	344.44	0.013	0.004	12.158	344.36	0.075	0.022	12.090	55.3	OK

Fresh Pack (0% SOC)			After T-1				After T-2				After T-3				After T-4				After T-5	Result
No	Weight (g)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Max Temp (℃)	
1	344.340	9.679	344.35	-0.010	-0.003	9.701	344.32	0.030	0.009	8.326	344.30	0.020	0.006	0.765	344.22	0.080	0.023	0.845	55.2	OK
2	344.240	9.695	344.24	0.000	0.000	9.706	344.21	0.030	0.009	8.348	344.21	0.000	0.000	0.640	344.14	0.070	0.020	0.920	55.5	OK
3	344.540	9.698	344.55	-0.010	-0.003	9.701	344.51	0.040	0.012	8.284	344.52	-0.010	-0.003	0.655	344.43	0.090	0.026	0.904	55.1	OK
4	344.220	9.681	344.23	-0.010	-0.003	9.705	344.21	0.020	0.006	8.301	344.19	0.020	0.006	0.748	344.12	0.070	0.020	0.831	55.2	OK
AVG	344.335	9.688	344.34	-0.008	-0.002	9.703	344.31	0.030	0.009	8.315	344.31	0.007	0.002	0.702	344.23	0.077	0.023	0.875	55.3	OK

●Sample : 100% Charged – 4 Ea , 0% Charged – 4 Ea

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T-1~T-5) Transportation Test (50Cycled Pack)

50cycled Pack(100% SOC)			After T-1				After T-2				After T-3				After T-4				After T-5	Result
No	Weight (g)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Max Temp (℃)	
1	344.420	12.823	344.40	0.020	0.006	12.907	344.40	0.000	0.000	12.459	344.39	0.010	0.003	12.311	344.32	0.070	0.020	12.184	55.3	OK
2	344.610	12.826	344.58	0.030	0.009	12.892	344.59	-0.010	-0.003	12.457	344.58	0.010	0.003	12.312	344.49	0.090	0.026	12.186	55.2	OK
3	344.610	12.836	344.60	0.010	0.003	12.922	344.57	0.030	0.009	12.464	344.57	0.000	0.000	12.307	344.49	0.080	0.023	12.192	55.3	OK
4	344.310	12.839	344.30	0.010	0.003	12.907	344.30	0.000	0.000	12.466	344.26	0.040	0.012	12.316	344.17	0.090	0.026	12.189	55.6	OK
AVG	344.488	12.831	344.47	0.018	0.005	12.907	344.47	0.005	0.001	12.462	344.45	0.015	0.004	12.312	344.37	0.082	0.024	12.188	55.4	OK

50cycled Pack(0% SOC)			After T-1				After T-2				After T-3				After T-4				After T-5	Result
No	Weight (g)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Weight (g)	Mass loss	Loss (%)	OCV (V)	Max Temp (℃)	
1	344.590	9.909	344.53	0.060	0.017	10.026	344.53	0.000	0.000	9.368	344.51	0.020	0.006	8.293	344.43	0.080	0.023	8.297	55.2	OK
2	344.710	9.933	344.72	-0.010	-0.003	10.080	344.71	0.010	0.003	9.294	344.68	0.030	0.009	8.202	344.61	0.070	0.020	8.125	55.2	OK
3	344.460	9.956	344.44	0.020	0.006	10.083	344.45	-0.010	-0.003	9.266	344.43	0.020	0.006	8.454	344.34	0.090	0.026	8.216	55.5	OK
4	344.450	9.938	344.45	0.000	0.000	10.062	344.43	0.020	0.006	9.143	344.42	0.010	0.003	8.312	344.35	0.070	0.020	8.193	55.1	OK
AVG	344.553	9.934	344.54	0.017	0.005	10.063	344.53	0.005	0.001	9.268	344.51	0.020	0.006	8.315	344.43	0.078	0.022	8.208	55.3	OK

●Sample : 50Cycled : 100% Charged – 4 Ea , 0% Charged – 4 Ea

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T-6) Impact Test (ICR18650-30A)

Fresh cell(50% SOC)		After T-6		Result
Cell No	OCV(V)	Max Temp(℃)	Test Result	
1	3.81	24.0	No Leakage	OK
2	3.81	24.0	No Leakage	OK
3	3.81	24.0	No Leakage	OK
4	3.81	24.0	No Leakage	OK
5	3.81	24.0	No Leakage	OK
AVG	3.81	24.00		OK
Max.	3.81	24.00		OK
Min.	3.81	24.00		OK

50cycled cell(0% SOC)		After T-6		Result
Cell No	OCV(V)	Max Temp(℃)	Test Result	
1	3.11	24	No Leakage	OK
2	3.12	24	No Leakage	OK
3	3.10	24	No Leakage	OK
4	3.11	24	No Leakage	OK
5	3.11	24	No Leakage	OK
AVG	3.11	24.00		OK
Max.	3.12	24.00		OK
Min.	3.10	24.00		OK

R10A Cell UN Test Report

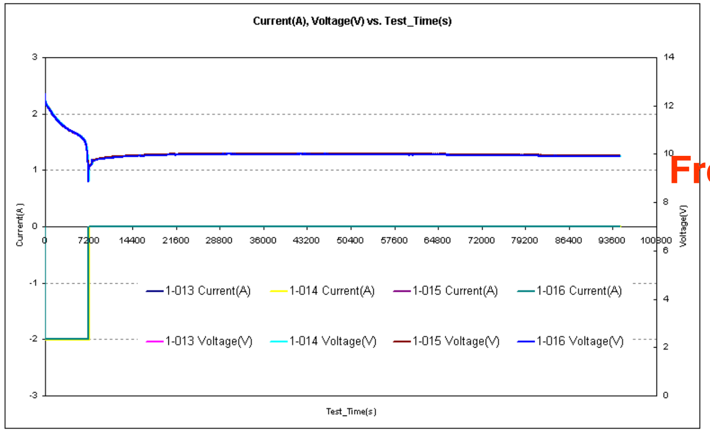
R10A UN Test

- **Test method: Drop 9.1kg mass from 61cm height with 15.8mm diameter bar.**
- **Sample : Fresh Cell – 5 Ea / 50 cycled Cell – 5 Ea**
- **Test results: All Leakage only .**

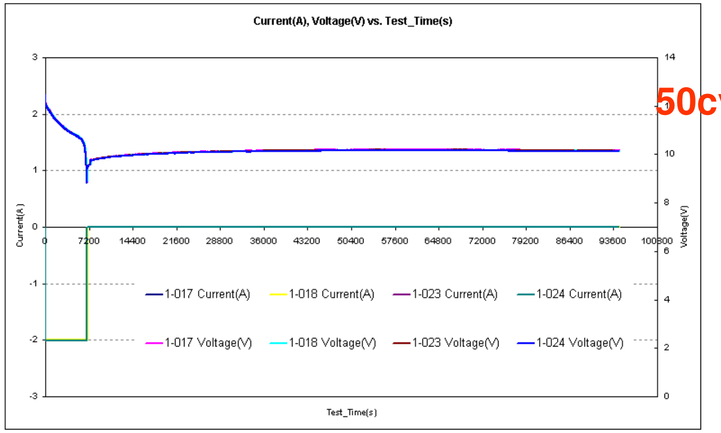
Model : AS2010B 6C_30A(black)

T-7) Over charge Test

※ curves shows representative Packs



Fresh pack



50cycled pack

- **Test method : 6[A], 24[V]**
  0.5C discharge → 24Hrs charge → 7days storage
- **Sample**
  Fresh Pack : (100% charged) – 4Ea
  50cycled Pack : (100% charged) – 4Ea
- **Test results : All no Leakage**
- **Protection circuit module**
  : Over charge current protection

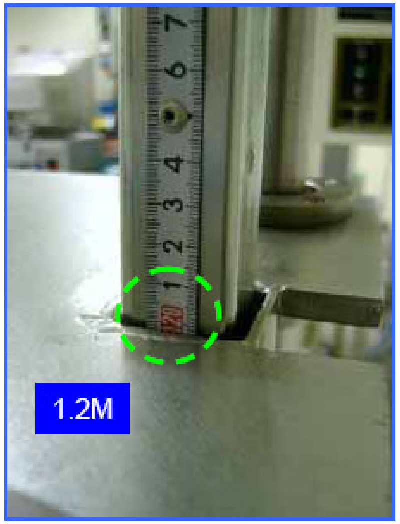
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P-1) Packaging Drop (1.2m) Test

- Test Procedure : 1.2m drop in weakest orientation
- Test Method : One Corner/ Three Edge/ Six Flat (Total Ten Times)
- Criteria : No damage to Packs / No shifting of Packs / No release of Packs
- Result : **Acceptable**



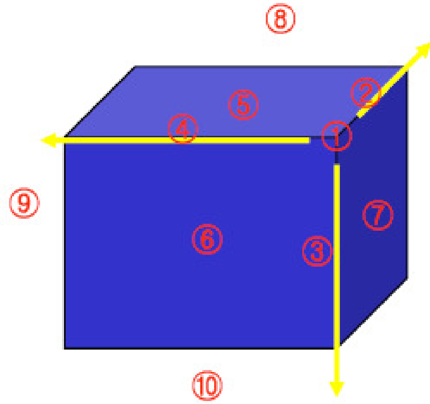
Test machine



Height Setting



Drop



-Test Position

① : Edges

②③④ : Box coner(a datum edges)

⑤⑥⑦⑧⑨⑩ : Box plane

Drop Point

Model : AS2010B 6C_30A(black)

P-1) Packaging Drop (1.2m) Test

Before test	On testing	After test
		